



## **WATER RESOURCES RESEARCH GRANT PROPOSAL**

**Project ID:** NC1441

**Title:** Effect of Riparian Buffers on Removal of Nutrients and Sediment in Urban Streams

**Focus Categories:** Water Quality, None

**Keywords:** urban water systems, water quality, riparian vegetation

**Start Date:** 03/01/2001

**End Date:** 02/28/2002

**Federal Funds:** \$17,199

**Non-Federal Matching Funds:** \$34,398

**Congressional District:** 6th

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**Abstract**

Riparian buffer zones in urban streams are recognized as being important in the protection and restoration of stream water quality, especially in terms of nutrient and sediment removal from runoff water (see Related Research). However, the specific water quality benefits of riparian buffers vary considerably with local conditions and have rarely been quantified for any particular set of local conditions. Management of vegetation within riparian buffer zones in urban areas is constrained by many conflicting needs, such as commercial, industrial, residential, and transportation land uses, as well as flood control, safety concerns, and water quality. In addition, the importance of considering management for improved water quality has only recently been recognized. But without clear scientific consensus or guidelines on the relative benefits of buffers of different types, managers are further constrained in their efforts to resolve apparently conflicting needs in order to include water quality criteria in their plans.

Urban streams in the Piedmont of North Carolina are characterized by poor water quality, high sedimentation, and impaired biotic habitat. Most of them are on the 303d list. The City of Greensboro is concerned about water quality of its streams and is instituting a large-scale effort to develop vegetated riparian buffers to improve water quality. However, the site -specific parameters for maximum buffering capacity for nutrient and sediment removal are unknown.

This project will isolate the effect of vegetation type on the quality of water passing through riparian buffers in an urban stream. We recognize that there are many aspects of riparian zones that also impact water quality, such as slope, soil type, and degree of saturation (see Related Research). However, we cannot address all of those issues in a one-year project with limited budget and choose to focus our initial efforts on vegetation type because: (1) vegetation type is a manageable aspect in many reaches of urban streams; (2) riparian vegetation is variable and being managed in Greensboro, the largest urban area in the Upper Cape Fear River Basin, thus comprehending its impact on water quality will be useful in guiding future management. Some other important aspects of stream riparian zones, notably soil type, slope, and

degree of saturation are either not manageable or would be far more costly and politically complex to manage.